Authors' Abstracts.

ABSTRACT OF PAPER READ AT THE MONTREAL MEETING OF THE GEOLOGICAL SOCIETY OF AMERICA.

Weathering of Alnoite in Manheim, N. Y. By. C. H. Smyth, Jr.

A somewhat altered dike of alnoite, consisting of biotite, serpentine, magnetite, perofskite, apatite, and some calcite, is exposed on the east bank of the East Canada Creek. Melilite, abundant in two neighboring dikes, is not apparent, doubtless being obscured by alteration.

On the west bank the dike is weathered to a fine yellowish-brown sandy clay, exposed about fifteen feet vertically. Under the microscope, the weathered material is seen to consist chiefly of biotite, magnetite, and perofskite, the other minerals being no longer recognizable.

From chemical analysis, it is evident that the rock in weathering has lost about 27 per cent., chiefly silica and magnesia, with less lime and potash. Alumina and titanic oxide show a relative gain in the same ratio, and are assumed to have remained constant. Iron also shows a relative gain, but slightly less than that of alumina, while it has undergone much oxidation. The amount of water has been very largely increased.

The greatest percentage of loss for a single constituent (excepting CO_2, which has totally disappeared) is shown in the case of potash, of which 92.27 per cent. has been removed. Soda has lost about 75 per cent., magnesia, 49 per cent., lime 45 per cent., silica, 27 per cent., and iron oxide less than 4 per cent.

The process of weathering has involved this considerable solution, together with oxidation and hydration. The accompanying physical changes are a complete change of color, and a disintegration so thorough that the material may be easily scooped out with the hands.

The contrast between alteration and weathering is pronounced. The former led to the formation of serpentine and calcite, without

oxidation. Weathering, on the other hand, destroyed both of these minerals and effected much oxidation. The first process could hardly be regarded as destructive, the last is eminently so.

The weathered dike occurs in the nearly vertical rock wall of the creek gorge, which is doubtless of postglacial origin. As the dike, in its present condition, would offer almost no resistance to the attack of the stream, it is evident that in the first stages of gorge cutting the rock must have been nearly or quite unweathered. From this it follows that the weathering, as now seen, has been accomplished in postglacial time.